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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,494	09/28/2001	Hong Xie	219.40430X00	2764
7590	03/22/2004		EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A. P.O. BOX 2938 MINNEAPOLIS, MN 55402			WILLIAMS, ALEXANDER O	
		ART UNIT	PAPER NUMBER	
		2826		

DATE MAILED: 03/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.	Applicant(s)	
	09/964,494	XIE ET AL.
Examiner	Art Unit	
Alexander O Williams	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) Responsive to communication(s) filed on 10 December 2003.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) Claim(s) 2-16, 19-32, 35-48, 51-54, 56-60 and 62-76 is/are pending in the application.
- 4a) Of the above claim(s) 15, 16, 31 and 32 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 2-14, 19-30, 35-46, 51-53, 56-59 and 62-76 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 18.
- 4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: \_\_\_\_\_.

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Serial Number: 09/96494 Attorney's Docket #: 219.4043X00  
Filing Date: 9/28/01;

Applicant: Xie et al.

Examiner: Alexander Williams

Applicant's RCE in Paper # 15, filed 12/10/03 has been acknowledged.

Applicant's Amendment, filed 12/10/03, in Paper No. 16 is acknowledged.

Applicant's election of species of Figure 9 with traverse (claims 1 to 14, 18 to 30, 34 to 46, 50 to 53, 55 to 59, 61 and 62) in Paper # 9, filed 3/20/03, has been acknowledged.

This application contains claims 15-17, 31-33, 47-49, 54 and 60 drawn to an invention non-elected with traverse in Paper No. 9. A complete response to the final rejection must include cancellation of non-elected claims or other appropriate action (see 37 CFR § 1.144 & MPEP § 821.01).

Claims 1, 17, 18, 33, 34, 49, 50, 55 and 61 have been canceled.

The disclosure is objected to because of the following informalities: This application should update any related application information.

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claim language in

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claims 72-76 as it relates to claim 70 and 70 and elected species figure 9 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claims 13, 29,45 and 72-76 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 13, 29 and 45, it is unclear and confusing to how "the IHS/IS is being electrically connected to the substrate.

In claims 72 to 76, it is unclear and confusing to what shows in elected species figure 9: "the third and forth stiffener portions"; "the first, second, third, and forth stiffener portions form a substantially rectangular window footprint"; "the first, second, third, and forth stiffener portions form a substantially rectangular window footprint with curved edges"; and "the first, second, third, and forth stiffener portions form four corner stiffening portions, each having a triangular footprint."

Any of claims 13, 29, 45 and 72-76 not specifically addressed above are rejected as being dependent on one or more of the claims which have been specifically objected to above.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:  
A person shall be entitled to a patent unless --

- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 6 to 14 and 63 are rejected under 35 U.S.C. § 102(e) as being anticipated by Chen (U.S. Patent # 6,191,478 B1).

For example, in claim 1, Chen (figures 1 to 8) specifically **figure 4a** show an integrated heat spreader/integrated stiffener (HIS/IS) **2** mountable to provide stiffening support to a substrate **37**, the heat spreader/integrated stiffener including a side wall portion (**side portion of 2**) to mount transverse to the substrate and a stiffener

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extension (**portion of 2 on top of 37**) to extend from the side wall portion toward a center of the heat spreader/integrated stiffener, the stiffener extension comprising an integrated stiffener extension which is substantially planar and mounted to a substantially planar die-side surface of the substrate.

Claims 2 to 5, 6 to 14 and 63 are rejected under 35 U.S.C. § 102(b) as being anticipated by Dudderar et al. (U.S. Patent # 5,767,447).

For example, in claim 1, Dudderar et al. (figures 1 to 3) specifically **figure 1** show an integrated heat spreader/integrated stiffener (HIS/IS) **600/504** mountable to provide stiffening support to a substrate **200**, the heat spreader/integrated stiffener including a side wall portion (**side portion of 504**) to mount transverse to the substrate and a stiffener extension to extend from the side wall portion toward a center of the heat spreader/integrated stiffener (**see column 3, line 32 to column 4, line 25**).

Initially, and with respect to claims 5, 21 and 37, note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re Fitzgerald, 205 USPQ 594, 596 (CCPA); In re Marosi et al., 218 USPQ 289 (CAFC); and most recently, In re Thorpe et al., 227 USPQ 964 (CAFC, 1985) all of which make it clear that it is the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that, as here, an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that Applicant has burden of proof in such cases as the above case law makes clear.

Claims 2 to 5, 19 to 30, 35 to 46, 51-53, 56-59, 62 and 64-76, **insofar as some of them can be understood**, are rejected under 35 U.S.C. § 103(a) as being unpatentable over in Chen (U.S. Patent # 6,191,478 B1) view of Greenwood (U.S. Patent # 6,338,985 B1).

Chen show the features of the claimed invention as detailed above, but fail to explicitly show one of a thin-core and coreless substrate of an integrated circuit printed circuit board carrier package.

Greenwood is cited for showing chip size semiconductor packages. Specifically, Greenwood (figures 1 to 10) specifically figures 1 and 3) discloses a thin-core substrate **12** of an integrated circuit printed circuit board carrier package (see column 4, lines 5-14) for the purpose of providing a package where reliability can be determined.

For example, in claim 18, the combination of Chen and Greenwood show a carrier package comprising: one of a thin-core and coreless substrate (**12 in Greenwood**) of an IC-PCB; and an (HIS/IS) (**2 in Chen**) mountable to provide stiffening support to a substrate.

Claims 5,21 and 37, as to the grounds of rejection under section 103, see MPEP § 2113.

For example, in claim 34, the combination of Chen and Greenwood show a packaged integrated circuit (IC) comprising: an IC-PCB carrier package including one of a thin-core and coreless substrate (**12 in Greenwood**) of an IC-PCB; and an (HIS/IS) (**2 in Chen**) mountable to provide stiffening support to a substrate.

For example, in claim 50, the combination of Chen and Greenwood show a heat spreader/stiffener device comprising a thermally conductive member (**2 in Chen**) having a stiffener portion mountable to one of thin-core and coreless substrate (**12 in Greenwood**) so as to increase a stiffness thereof, the heat spreader/stiffener device having a thermal path thermally connectable to the substrate.

For example, in claim 55, the combination of Chen and Greenwood show an integrated circuit (IC) carrier package comprising: an IC; at least one of a thin-core and coreless substrate (**12 in Greenwood**); and heat spreader/stiffener device comprising a thermally conductive member (**2 in Chen**) having a stiffener portion mountable to one of thin-core and coreless substrate so as to increase a stiffness thereof, the heat spreader/stiffener device having a thermal path thermally connectable to the substrate.

For example, in claim 61, the combination of Chen and Greenwood show an electronic system comprising: an integrated circuit (IC) carrier package comprising: an IC; at least one of a thin-core and coreless substrate (**12 in Greenwood**); and heat spreader/stiffener device comprising a thermally conductive member (**2 in Chen**) having a stiffener portion mountable to one of thin-core and coreless substrate so as to increase a stiffness thereof, the heat spreader/stiffener device having a thermal path thermally connectable to the substrate.

Therefore, it would have been obvious to one of ordinary skill in the art to use Greenwood's thin-core substrate to modify Chen's substrate for the purpose of providing a package where reliability can be determined.

Claims 2 to 5, 19 to 30, 35 to 46, 51-53, 56-59, 62 and 64-76, **insofar as some of them can be understood**, are rejected under 35 U.S.C. § 103(a) as being

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unpatentable over in Dudderar et al. (U.S. Patent # 5,767,447) view of Greenwood (U.S. Patent # 6,338,985 B1).

Dudderar et al. show the features of the claimed invention as detailed above, but fail to explicitly show one of a thin-core and coreless substrate of an integrated circuit printed circuit board carrier package.

Greenwood is cited for showing chip size semiconductor packages. Specifically, Greenwood (figures 1 to 10) specifically figures 1 and 3) discloses a thin-core substrate **12** of an integrated circuit printed circuit board carrier package (see column 4, lines 5-14) for the purpose of providing a package where reliability can be determined.

For example, in claim 18, the combination of Dudderar et al. and Greenwood show a carrier package comprising: one of a thin-core and coreless substrate (**12 in Greenwood**) of an IC-PCB; and an (HIS/IS) (**600/504 in Dudderar et al.**) mountable to provide stiffening support to a substrate.

Claims 5,21 and 37, as to the grounds of rejection under section 103, see MPEP § 2113.

For example, in claim 34, the combination of Dudderar et al. and Greenwood show a packaged integrated circuit (IC) comprising: an IC-PCB carrier package including one of a thin-core and coreless substrate (**12 in Greenwood**) of an IC-PCB; and an (HIS/IS) (**600/504 in Dudderar et al.**) mountable to provide stiffening support to a substrate.

For example, in claim 50, the combination of Dudderar et al. and Greenwood show a heat spreader/stiffener device comprising a thermally conductive member (**600/504 in Dudderar et al.**) having a stiffener portion mountable to one of thin-core and coreless substrate (**12 in Greenwood**) so as to increase a stiffness thereof, the heat spreader/stiffener device having a thermal path thermally connectable to the substrate.

For example, in claim 55, the combination of Dudderar et al. and Greenwood show an integrated circuit (IC) carrier package comprising: an IC; at least one of a thin-core and coreless substrate (**12 in Greenwood**); and heat spreader/stiffener device comprising a thermally conductive member (**600/504 in Dudderar et al.**) having a stiffener portion mountable to one of thin-core and coreless substrate so as to increase a stiffness thereof, the heat spreader/stiffener device having a thermal path thermally connectable to the substrate.

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For example, in claim 61, the combination of Dudderar et al. and Greenwood show an electronic system comprising: an integrated circuit (IC) carrier package comprising: an IC; at least one of a thin-core and coreless substrate (**12 in Greenwood**); and heat spreader/stiffener device comprising a thermally conductive member (**600/504 in Dudderar et al.**) having a stiffener portion mountable to one of thin-core and coreless substrate so as to increase a stiffness thereof, the heat spreader/stiffener device having a thermal path thermally connectable to the substrate.

Therefore, it would have been obvious to one of ordinary skill in the art to use Greenwood's thin-core substrate to modify Dudderar et al.'s substrate for the purpose of providing a package where reliability can be determined.

## Response

Applicant's arguments filed 12/10/03 have been fully considered, but are moot in view of the new grounds of rejections detailed above.

The listed references are cited as of interest to this application, but not applied at this time.

Field of Search	Date
U.S. Class and subclass: 257/712,713,717,720,700,701,738,704,706,710,696- 698,738,737,734,778,734	5/30/03 9/18/03 3/16/04
Other Documentation: foreign patents and literature in 257/712,713,717,720,700,701,738,704,706,710,696- 698,738,737,734,778,734	5/30/03 9/18/03 3/16/04
Electronic data base(s): U.S. Patents EAST	5/30/03 9/18/03 3/16/04

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander O Williams whose telephone number is (571) 272 1924. The examiner can normally be reached on M-F 6:30-7:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272 1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AOW  
3/17/04



Alexander Williams  
Primary Examiner